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NOTES AND LITERATURE

GENERAL BIOLOGY

The Philosophical Problem of Life.—Dr. Verworn, Professor of Physiology at Göttingen, has recently published a lecture upon the investigation of life, delivered before the society of political science at Berlin.¹ At the outset he states that the search for a cause in biology is unfruitful and unscientific. “There is no process in the world which is determined by a single cause. Every process is always dependent upon a number of other processes and it is unjustifiably arbitrary to select one of these and to account it the first cause. . . . A scientific investigator can only establish the several conditions which are necessary for the occurrence of a process. If these are known, the process is accounted for,—explained. The process is nothing more than the expression of the sum of the concomitant conditions. The conception of cause becomes therefore superfluous and worthless.”

Accordingly one must regard as superficial such affirmations as that an insect is colored green because it is thereby protected, or that a mammalian embryo has gill clefts because its ancestors did.

From the study of the conditions of life Professor Verworn concludes that,—“To produce life artificially we must know completely *all* the elements of the living substance. We must know the relative amounts. We must understand their arrangement in the cell body. If we could construct such a system, fulfilling all the conditions of life, the artificial cell would at once live. It would certainly be extremely interesting to see how the artificial organism would live, reproduce, and transmit its qualities—but the prospect of producing life is a complete Utopia. We have not learned to approach the complex conditions involved in a living organism. . . . The chemical fabric of a cell should first be so understood that it could be imagined as a great machine shop, in which the mechanism of life could be observed by wandering among the atoms as among wheels and cylinders.”

Consciousness also is held to be a product of these conditions. If, according to DuBois-Reymond, we could bring together at once and in their proper relations all the atoms of which Cæsar was composed

¹ Verworn, M. *Die Erforschung des Lebens*. Gustav Fischer, Jena, 1907. 45 pp. 1 Mk. 80 Pf.

when he crossed the Rubicon, we should have reconstructed Cæsar, body and soul. The artificial Cæsar would have the same sensations, aspirations, and ideas as his predecessor at the Rubicon. Both consciousness and life, therefore, are the expression of definite *conditions* to determine which is the object of scientific investigation.

Professor Verworn here ascribes as a cause of consciousness an unknown arrangement of atoms. A more conservative opinion has been expressed by an American biologist, as follows,¹ — “The work of physiologists has been so devoted to the physical and chemical phenomena of life that the conviction is widespread that all vital phenomena are capable of a physical explanation. . . . Let us give up the ineffectual struggle to discover the essential nature of consciousness until we can renew it with much larger resources of knowledge.”

In regarding the construction of a living cell as a complete Utopia, Professor Verworn differs from Professors Le Dantec and Cresson. The former writes,² — “Our knowledge of colloids is still so recent and rudimentary, that we ought not to expect to see the making of a cell accomplished soon; but it will come some day by careful analysis, permitting a rational synthesis. . . . The scientific world today is so prepared for the discovery that the premature announcement of spontaneous generation in gelatine submitted to the action of radium surprised no one. . . . It is not necessary for an enlightened mind to see protoplasm made to be convinced of the absence of any essential difference,— any real discontinuity, between living and dead matter.”

Professor Cresson,³ after quoting Büchner that “doubtless some day it will be possible to form living protoplasm artificially,” adds,— “Such a hope is at least somewhat reasonable and probable.” When, however, it is considered that nowhere in nature are such conditions known to be realized at present, and that the conditions in the past when life arose are equally unknown, one is inclined to accept Professor Verworn’s characterization,— a complete Utopia.

It is unnecessary to refer further to Dr. Le Dantec’s volume, which was published some months ago in English, and has been frequently reviewed. Dr. Cresson’s more recent volume is a simple introduction to naturalistic philosophy. The author describes the development

¹ Minot, C. S. The problem of consciousness in its biological aspects. *Science*, N. S. vol. 16, 1902. pp. 1-12.

² Le Dantec, Félix. *Éléments de philosophie biologique*. Félix Alcan, Paris, 1907. 297 pp. 3 fr. 50.

³ Cresson, André. *Les bases de la philosophie naturaliste*. Félix Alcan, Paris, 1907. 179 pp. 2 fr. 50.

of natural science and its conflict with the "old geocentric and anthropocentric philosophy which seduced and satisfied our ancestors. . . . Science has descended upon this philosophy like a tempest and nothing is left. The earth is not the center of creation. Man is not an exception in the universe. The adaptation between living things and their environment is explained by evolutionary principles without supposing an intelligent creator." In the preface, philosophy is said to be a matter of temperament. "For some, naturalism is the final word of true metaphysics; for others, it is devoid of all truth." In this way, perhaps, the author acknowledges, that there are many who see in evolutionary principles the manifestation of an intelligent creator; and who find in man, though one animal among many, much that is exceptional. It is stated by Professor Cresson that naturalistic philosophy is not science, though suggested by it. The determination of the conditions of life, as described by Verworm, is science itself.

F. T. L.

The Capitalization of Specific Names.—It is agreed that the name of a genus shall always begin with a capital letter and that the specific name shall usually begin with a small letter. Zoologists are inclined to begin specific names invariably with small letters, but botanists employ capitals for a variety of purposes as shown in the following examples:

Zoological Names.	Botanical Names.
a. <i>Sitta canadensis</i>	<i>Juncus Canadensis</i>
b. <i>Lampetra wilderi</i>	<i>Smilax Walteri</i>
c. <i>Gastropacha ilicifolia</i>	<i>Lythrum Hyssopifolia</i>
d. <i>Bernornis isabellae</i>	<i>Rosa Beatricis</i>

Whatever reasons exist for beginning these botanical names with capitals apply with equal force to the zoological names; and the advantages of the invariable rule for lower case letters are no greater in zoology than in botany. Moreover, as expressed by the Vienna Congress of botanists,— "The principles and forms of nomenclature should be as similar as possible in botany and in zoology." In the matter of capitalization of specific names, one rule should apply to both. In order to determine upon a uniform practice for the *Naturalist* (in which botanical and zoological names should appear with equal frequency) the editor examined the following codes.

1842. A committee of the British Association, appointed "to consider of the rules by which the Nomenclature of Zoology may be established on a uniform and permanent basis," presented various